

IN THE CLAIMS:

Please amend Claims 30, 33-36, 46, 48, 51-55 and 60-64 as indicated below. The following is a complete listing of claims and replaces all prior versions and listings of claims in the present application:

1-29. (Canceled).

30. (Currently amended) A method for fingerprinting an audio waveform, comprising:

defining a codebook which represents a multivariate vector of one or more spectral features with one of a plurality of codes, each code corresponding to a bin and representing a portion of a predetermined audio waveform;

dividing the audio waveform into a plurality of bins,

for each bin of the plurality of bins, computing one or more spectral features for the bin,

wherein the computing comprises:

computing the one or more spectral features for a first group of data points within the bin;

shifting some number of data points within the bin; and

computing the one or more spectral features for a second group of data points within the bin; [[and]]

generating a fingerprint by representing the audio waveform with a string of codes from the codebook, each code corresponding to a segment of the audio waveform ~~and temporally aligned in the string with the corresponding segment of the audio waveform; and~~
aligning the string of codes in a time series.

31. (Previously presented) The method of claim 30, wherein one or more data points in the first group overlap with one or more data points in the second group.

32. (Previously presented) The method of claim 30 wherein each code is a hash code.

33. (Currently amended) The method of claim 30 further comprising:
compressing the string of codes from the codebook to form a compressed string, wherein the codes of the compressed string are aligned in a time series ~~temporally aligned with the corresponding segment of the waveform.~~

34. (Currently amended) A method for creating a signature of an audio waveform, comprising:

dividing the audio waveform into a plurality of bins;

for the plurality of the bins, selecting a first group of data points within each bin, and computing one or more spectral features for each bin based upon the first group of points within the plurality of bins,

and for the plurality of bins, selecting a second group of data points within each bin, and computing one or more spectral features for each bin based upon the second set of data points within the bins of the plurality;

referencing a codebook of multivariate vectors using the one or more spectral properties; and

creating one or more signatures representing the audio waveform with a string of codes from the codebook, each code corresponding to a segment of the audio waveform.

35. (Currently amended) The method of claim 34 wherein each code in the string represents the waveform over a portion of the waveform, and wherein the codes are ~~temporally aligned with the waveform such that the position of a code within the string corresponds to a time period of the waveform~~ aligned in a time series.

36. (Currently amended) The method of claim 35, further comprising:
compressing the string such that ~~temporal~~ the time series alignment ~~between the string and the waveform~~ is maintained.

37. (Previously presented) The method of claim 35, further comprising:
comparing a signature of the one or more signatures that initiates at a given time with a representation of an audio segment.

38. (Previously presented) The method of claim 37, further comprising:

defining a codebook which represents a vector of one or more spectral features with a code, prior to referencing said codebook.

39. (Previously presented) The method of claim 34 wherein one or more signatures is created for each bin.

40-45. (Canceled)

46. (Currently amended) A method for creating a signature for an audio waveform, comprising:

dividing the audio waveform into a plurality of bins;

for the plurality of the bins, selecting a first group of data points within each bin, and computing one or more spectral properties for each bin based upon the first group of points within the plurality of bins,

and for the plurality of bins, selecting a second group of data points within each bin, and computing one or more spectral properties for each bin based upon the second set of data points within the plurality of bins;

referencing a codebook of hash values representing a multivariate vector using the computed one or more spectral properties; and

creating one or more signatures representing the audio waveform with a string of hash values from the codebook, each hash value corresponding to a segment of the waveform.

47. (Previously presented) The method of claim 34, wherein each code is a hash code.

48. (Currently amended) A computer program product comprising a computer-readable memory medium having control logic stored therein for causing a computer to fingerprint an audio waveform, said control logic comprising:

computer readable program code means for causing the computer to define a codebook which represents a multivariate vector of one or more spectral features with one of a plurality of codes, each code corresponding to a bin and representing a portion of a predetermined audio waveform;

computer readable program code means for causing the computer to divide the audio waveform into a plurality of bins;

computer readable program code means for causing the computer to compute one or more spectral features for a first group of data points within each bin of the plurality of bins;

computer readable program code means for causing the computer to shift some number of data points within each bin of the plurality of bins; and

computer readable program code means for causing the computer to compute one or more spectral features for a second group of data points within each bin of the plurality of bins; [[and]]

computer readable program code means for causing the computer to generate a fingerprint by representing the audio waveform with a string of codes from the codebook, each

code corresponding to a segment of the audio waveform ~~and temporally aligned in the string with the corresponding segment of the audio waveform; and~~

computer readable program code means for causing the computer to align the string of codes in a time series.

49. (Previously presented) The computer program product of claim 48, wherein one or more data points in the first group overlap with one or more data points in the second group.

50. (Previously presented) The computer program product of claim 48, wherein each code is a hash code.

51. (Currently amended) The computer program product of claim 48, further comprising:

computer readable program code means for causing the computer to compress the string of codes from the codebook to form a compressed string, wherein the codes of the compressed string are aligned in a time series ~~temporally aligned with the corresponding segment of the waveform.~~

52. (Currently amended) An apparatus for fingerprinting an audio waveform, comprising:

means for defining a codebook which represents a multivariate vector of one or more spectral features with one of a plurality of codes, each code corresponding to a bin and representing a portion of a predetermined audio waveform;

means for dividing the audio waveform into a plurality of bins[[,]];

means for computing one or more spectral features for a first group of data points within each bin of the plurality of bins;

means for shifting some number of data points within each bin of the plurality of bins; and

means for computing the one or more spectral features for a second group of data points within each bin of the plurality of bins; and

means for generating a fingerprint by representing the audio waveform with a string of codes from the codebook, each code corresponding to a segment of the audio waveform ~~and temporally aligned in the string with the corresponding segment of the audio waveform;~~ and

means for aligning the string of codes in a time series.

53. (Currently amended) A computer program product comprising a computer-readable memory medium having control logic stored therein for causing a computer to create a signature of an audio waveform, said control logic comprising:

computer readable program code means for causing the computer to divide the audio waveform into a plurality of bins;

computer readable program code means for causing the computer to select a first group of data points within each bin;

computer readable program code means for causing the computer to compute one or more spectral features for each bin based upon the first group of points within the plurality of bins;

computer readable program code means for causing the computer to select a second group of data points within each bin;

computer readable program code means for causing the computer to compute one or more spectral features for each bin based upon the second set of data points within the bins of the plurality;

computer readable program code means for causing the computer to reference a codebook using the one or more spectral features, wherein the codebook represents at least one multivariate vector; and

computer readable program code means for causing the computer to create one or more signatures representing the audio waveform with a string of codes from the codebook, each code corresponding to a segment of the audio waveform.

54. (Previously presented) The computer program product of claim 53, wherein each code in the string represents the waveform over a portion of the waveform, and wherein the codes are aligned in a time series ~~temporally aligned with the waveform such that the position of a code within the string corresponds to a time period of the waveform.~~

55. (Currently amended) The computer program product of claim 54, further comprising:

computer readable program code means for causing the computer to compress the string such that the time series ~~temporal alignment between the string and the waveform~~ is maintained.

56. (Previously presented) The computer program product of claim 54, further comprising:

computer readable program code means for causing the computer to compare a signature of the one or more signatures that initiates at a given time with a representation of an audio segment.

57. (Previously presented) The computer program product of claim 56, further comprising:

computer readable program code means for causing the computer to define a codebook which represents a vector of one or more spectral features with a code, prior to referencing said codebook.

58. (Previously presented) The computer program product of claim 53, wherein one or more signatures is created for each bin.

59. (Previously presented) The computer program product of claim 53, wherein each code is a hash code.

60. (Currently amended) An apparatus for creating a signature of an audio waveform, comprising:

- means for dividing the audio waveform into a plurality of bins;
- means for selecting a first group of data points within each bin;
- means for computing one or more spectral features for each bin based upon the first group of points within the plurality of bins;
- means for selecting a second group of data points within each bin;
- means for computing one or more spectral features for each bin based upon the second set of data points within the bins of the plurality;
- means for referencing a codebook using the one or more spectral features, wherein the codebook represents at least one multivariate vector; and
- means for creating one or more signatures representing the audio waveform with a string of codes from the codebook, each code corresponding to a segment of the audio waveform.

61. (Currently amended) A method for fingerprinting an audio waveform, comprising:

- defining a codebook which represents a multivariate vector of one or more spectral features with a corresponding one of a plurality of codes;
- dividing the audio waveform into a plurality of bins;
- for each bin, computing one or more spectral features for that bin; and
- generating a fingerprint by representing the audio waveform with a string of codes from the codebook based on the computed one or more spectral features for each bin.

62. (Currently amended) An apparatus for fingerprinting an audio waveform, comprising:

a memory operable to store a codebook which represents a multivariate vector of one or more spectral features with a corresponding one of a plurality of codes; and

a processor operable to divide the audio waveform into a plurality of bins, compute one or more spectral features for each bin, and generate a fingerprint representing the audio waveform with a string of codes from the codebook based on the computed one or more spectral features for each bin.

63. (Currently amended) A computer program product comprising a computer-readable memory medium having control logic stored therein for causing a computer to create a signature of an audio waveform, said control logic comprising:

computer readable program code means for causing the computer to define a codebook which represents a multivariate vector of one or more spectral features with a corresponding one of a plurality of codes;

computer readable program code means for causing the computer to divide the audio waveform into a plurality of bins;

computer readable program code means for causing the computer to compute one or more spectral features for each bin; and

computer readable program code means for causing the computer to generate a fingerprint representing the audio waveform with a string of codes from the codebook based on the computed one or more spectral features for each bin.

64. (Currently amended) An apparatus for fingerprinting an audio waveform, comprising:

means for defining a codebook which represents a multivariate vector of one or more spectral features with a corresponding one of a plurality of codes;

means for dividing the audio waveform into a plurality of bins;

means for computing one or more spectral features for each bin; and

means for generating a fingerprint by representing the audio waveform with a string of codes from the codebook based on the computed one or more spectral features for each bin.